



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,789	04/03/2006	Steffen Pfeiffer	4385-051182	5011

28289 7590 02/27/2009  
THE WEBB LAW FIRM, P.C.  
700 KOPPERS BUILDING  
436 SEVENTH AVENUE  
PITTSBURGH, PA 15219

EXAMINER
----------

LISTVOYB, GREGORY

ART UNIT	PAPER NUMBER
----------	--------------

1796

MAIL DATE	DELIVERY MODE
-----------	---------------

02/27/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/539,789	<b>Applicant(s)</b> PFEIFFER ET AL.	
	<b>Examiner</b> GREGORY LISTVOYB	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 25-34 and 37-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 25-34 and 37-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/12/2008 has been entered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 25-34, 37, 39-48 rejected under 35 U.S.C. 103(a) as being unpatentable over Borner et al (WO02/40564, cited in IDS, in the present Office Action this document cited with equivalent US 20040024131) herein Borner in view of Adams et al (US 2473463, cited in the previous Office Action) and in further view of Michel et al (US 4271286)

Borner teaches a direct synthesis process for preparing etherified melamine resin condensates wherein

Art Unit: 1796

a) in the first step of the reaction, an etherified melamine resin precondensate is prepared in alcoholic solution (Methanol, see Example 1, meets the limitations of Claim 27 and Claim 28) with formaldehyde (meeting limitation of Claims 29 and 31) at temperature 20-100C (meeting the limitations of claim 34 and newly added claim 48);

b) in the first step (see Example 1), the concentration of the etherified melamine resin precondensate in alcoholic solution is increased, C4-C18 alcohols (C4 butanol, see Example 1);

Borner teaches re-concentration of the product after addition of 2L of methanol, which can be considered as a second vaporization step (see Example 1);

c) in a second step of the reaction, the increased-concentration melamine resin precondensate is reacted, using a mixer (extruder, see Example 1).

Regarding claim 26, Borner teaches that after the second step of the reaction, the etherified melamine resin condensate is discharged and palletized (granulated) (see Example 2).

Regarding claims 29-30, Borner teaches a process, which takes place at pH of 6.5-9, preferably 7-8 (see line 0030).

Regarding claim 41-42, Borner teaches highly vented extruder (see Claim 9). Although Borner does not teach the details of the extruder, it would have been obvious

Art Unit: 1796

to a person of ordinary skill in the art that it should have very effective vapor removal system, since harmful formaldehyde releases during the process.

Regarding Claim 43, Borner teaches addition of up to 60% of particulate additives (see line 0040).

Borner does not teach Molecular Weight of 500 to 50 000. However, the resulting resin is palletized, which suggests that its Molecular weight is at least 500.

Borner does not disclose any exact solid content after vaporization (i.e. before the extrusion).

However, it would have been obvious to a person of ordinary skills in the art to obtain 95-99% solids in Borner's process in order to make extrusion procedure more effective. In addition, low amount of aggressive volatiles does not create any safety, corrosion and health issues during the above step of the process.

Therefore, it would have been obvious to a person of ordinary skills in the art to load an extruder with highly concentrated solid product in order to avoid corrosion and health issues during the above step of the process.

Art Unit: 1796

Note that Borner teaches addition of Butanol after neutralization step, which makes trans-esterification process improbable. Therefore, Borner polymer is not free from  $\text{NH-CH}_2\text{-O-CH}_2\text{-NH}$ , since methylol groups tend to react with each other.

The Borner's process has a disadvantage of releasing poisonous formaldehyde during the kneading process. In addition, product, having longer alcohol has better elasticity.

In summary, Borner does not teach the melamine resin condensates are free from hydroxymethyleneamino groups bonded to the triazine rings of the melamine resin condensate and from  $\text{-NH-CH}_2\text{-O-CH}_2\text{-NH-}$  groups linking triazine ring.

Adams teaches a process for making a fully methylated melamine-formaldehyde composition, which obtained by trans-etherification with butanol (see Examples, particularly Example 3), where first step represents methylolation with a subsequent etherification. The above process is well known in the industry. It allows preventing additional polymerization of formaldehyde to paraformaldehyde. Adams teaches etherification process at pH 5.5-6.5 (see Column 4, line 65, meeting the limitations of Claim 30 and 31) at 86-91°C (see Column 6, line 15, meeting the limitations of claim 34) and melamine –formaldehyde ratio of 1:3 (see Example 3, meeting the limitation of Claim 35). Adams teaches both simultaneous and sequential processes (see

Art Unit: 1796

Examples). Adams teaches that increased concentration of the condensate after vaporization is 10-85%.

Regarding Claim 33, Adams discloses a process at the presence of ion-exchange resins (see Example 3).

Regarding Claim 37, Adams teaches two step distillation (see Examples).

In reference to Claim 40, Adams teaches addition of acid –modified butanol (see Examples).

Therefore, it would have been obvious to a person of ordinary skills in the art to modify Borner's process with Adams, since it will lead to a safer process (since no poisonous gas releases during the extrusion) and create a product with better mechanical properties (i.e. elasticity). In addition, Adams's process prevents forming a by-product (polyparaformaldehyde), which can deteriorate the performance of the target composition.

Borner and Adams do not teach a new limitation of claim 25, which claims solid content of etherified precondensate in alcoholic solution within the range of 65-85% wt.

Michel teaches a process for preparation of methyloltriazines etherified with alkanols.

In particular, he teaches reaction of melamine, formaldehyde and methanol with following evaporation step, where solid content of the reaction product is 75% wt (see Example 1).

Michel's process allows to achieve high storage stability of the resulting precondensate along with economical advantages. Solid content of Michel's product is low enough for undesirable crystallization of the precondesate and high enough for handling of the solution (i.e. transportation, piping, etc. ) (see Column 1, line 65).

In addition, this step is advantageous from economical reason. Firstly, having highly concentrated melamine resin requires lower apparatus volume, needed for further pre-concentration before the extrusion step. Secondly lower amount of material is much easier to handle. Thirdly, evaporating lower amount of solvent require less demanding drying equipment. For instance, composition, having 75-85% of resin content represents solid mass, which requires only a heater with metal pane with venting, whereas liquid composition requires vacuumed reactor with stirrer.

Therefore, it would have been obvious to a person of ordinary skills in the art to pre-concentrate melamine resin to 65-85%, achieving solid state material in order to provide more economical and technologically sound process



Claim 38 rejected under 35 U.S.C. 103(a) as being unpatentable over Borner in view of Adams and Michel as applied to claims 25-34, 37, 39-48 above, and further in view of Horacek (US 5206066) herein Horacek.

Borner teaches a direct synthesis process for preparing etherified melamine resin condensates wherein

a) in the first step of the reaction, an etherified melamine resin precondensate is prepared in alcoholic solution (Methanol, see Example 1, meets the limitations of Claim 27 and Claim 28) with formaldehyde (meeting limitation of Claim 29),

b) in at least one vaporization step (see Example 1), the concentration of the etherified melamine resin precondensate in alcoholic solution is increased, C4-C18 alcohols (C4 butanol, see Example 1).

c) in a second step of the reaction, the increased-concentration melamine resin precondensate is reacted, using a mixer (extruder, see Example 1).

Adams teaches a process for making a fully methylated melamine-formaldehyde composition, which obtained by trans-etherification with butanol (see Examples, particularly Example 3), where first step represents methylolation with a subsequent etherification.

Michel teaches a process for preparation of methyloltriazines etherified with alkanols, where he teaches reaction of melamine, formaldehyde and methanol with

Art Unit: 1796

following evaporation step, where solid content of the reaction product is 75% wt (see Example 1).

Borner, Adams and Michel do not teach diol as etherification agent.

Horacek discloses a melamine-formaldehyde resin, modified with diol (see Abstract and Column 2, line 30), such as 1,4 butane diol.

The advantage of Horacek resin is that it exhibits low shrinkage during curing and good mechanical properties (high flexibility) (see Column1, line 30).

Therefore, it would have been obvious to a person of ordinary skills in the art to use diols in Borner/Adams processes in order to achieve low shrinkage during curing and high flexibility.

### ***Response to Arguments***

Applicant's arguments with respect to claims 25-34 and 37-48 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments drawn to solid content after first vaporization step in view of new limitations of Claim 25. New reference (Michel) applied in the present Office

Art Unit: 1796

Action cures deficiency of the previous rejection under 35 USC 103(a) based on Borner and Adams.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY LISTVOYB whose telephone number is (571)272-6105. The examiner can normally be reached on 10am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (571) 272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rabon Sergent/  
Primary Examiner, Art Unit 1796

GL